

**CHAPTER 3.7**  
**GEOTEXTILE**

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### **CHAPTER 3.7 GEOTEXTILE**

3.7-1. **GENERAL.** Geotextiles consist of woven or nonwoven textile sheets supplied to the job site in large rolls. The majority of geotextiles used in landfill systems are made from either polypropylene or polyester. When ready for placement, the rolls are removed from their protective covering, properly positioned and unrolled over the subgrade. Geotextiles can be used for separation of materials, filtration, reinforcement, and erosion control. This section will focus on geotextiles used for separation and filtration. A separation/filtration layer is normally required between a soil layer and an underlying drainage layer. The separation/filtration layer ensures consistent drainage properties by preventing migration of fine grained soil particles into the void spaces of the drainage layer.

a. Preconstruction Submittals. The contractor should provide preconstruction submittals as required by the specifications. The following is a list of typical submittal requirements.

- (1) Manufacturer's QC test results.
- (2) For needle punched geotextiles, the manufacturer should certify that the geotextile has been continuously inspected using permanent in-line full-width metal detectors and does not contain any needles which could damage other geosynthetic layers.
- (3) Proposed thread type for sewn seams along with data sheets showing the physical properties of the thread. The thread typically is made from polypropylene, polyester, nylon, or a proprietary material.
- (4) Geotextile samples (if required).

b. Construction Submittals. The contractor should provide construction submittals as required by the specifications. The following is a list of typical submittal requirements.

Seam strength test results (if required).

c. Delivery, Storage and Handling.

- (1) A QA Representative should be present during delivery and unloading of the geotextile to inspect for damage.
- (2) Verify that rolls are labeled with the manufacturers name, product identification, lot number, roll number, roll dimensions, and date manufactured.
- (3) The QA Representative should record roll numbers, date delivered, name of manufacturer, and product type. This data is used to verify manufacturer's QC data sheets have been submitted for the rolls being delivered.
- (4) Verify each geotextile roll is wrapped around a central core and covered with an opaque, waterproof, protective covering. Require that tears in the packaging be repaired using tape and plastic sheeting to restore a waterproof protective barrier around the geotextile.

(5) Rolls should be immediately rewrapped after QA/QC samples have been collected.

(6) Geotextile rolls should be handled and unloaded with load carrying straps, a fork lift with a stinger bar, or an axial bar assembly should be used.

(7) Do not allow rolls to be dragged, lifted by one end, or dropped to the ground.

(8) Field storage should not be in areas where water can accumulate. Rolls of geotextile should either be elevated off the ground or placed on a sacrificial sheet of plastic. Saturated geotextile is difficult to handle.

(9) Rolls should not be stacked so high that the cores are crushed or the geotextile is damaged.

### 3.7-2. PRODUCTS.

#### Geotextile.

(1) Cross check the roll numbers of the geotextile delivered to the site against the roll numbers on the manufacturer's QC test data submittals to ensure they match. Ensure the geotextile meets the property requirements outlined in the specifications for material type and physical properties.

(2) More than one type of geotextile is often required on a job, verify the correct geotextile type is being used for each component of the job.

### 3.7-3. EXECUTION.

a. Subgrade Preparation. Inspect the surface underlying the geotextile prior to installation. It should be smooth and free of ruts or protrusions which are greater than the specified requirements (typically 25 mm (1 inch)). Verify the lines and grades of the subgrade are correct prior to geotextile placement.

#### b. Installation.

(1) A QA Representative should be present at all times during geotextile placement.

(2) Geotextile should be laid smooth so that it is free of tensile stresses, folds, and wrinkles.

(3) On slopes greater than 5 horizontal on 1 vertical, the geotextile should be unrolled parallel to the direction of maximum slope.

(4) Do not allow geotextile to be dragged across the surface of a textured geomembrane. This will result in damage to the geotextile.

(5) Inspect the geotextile for damage if it has been placed on a textured geomembrane surface and then removed from the membrane.

(6) No personnel working on the geotextile should smoke or wear

shoes which could damage the geosynthetics.

(7) Any area requiring repair should be clearly marked.

c. Protection.

(1) Ensure that geotextile is protected during installation from clogging, tears, and other damage.

(2) Ensure ballast (typically sand bags) is used to prevent wind damage to deployed geotextile.

(3) Check the specifications to determine the maximum allowable exposure time for the deployed geotextile. In general, geotextiles made from polypropylene should not be left uncovered for more than 14 days during installation. Geotextiles made from polyester may be left uncovered for up to 28 days. If the allowable exposure period has been exceeded, one method of determining if the geotextiles have been damaged is to require the contractor to perform QC tests to verify the physical properties of the textile have not diminished due to exposure.

(4) The use of staples or pins to hold geotextiles in place should not be allowed in applications where the geotextile will be located adjacent to other geosynthetics.

d. Seaming. Review the drawings and specifications to determine if overlap, sewn, or thermally bonded seams are required. Geotextile seams are typically overlapped in flat areas such as landfill liner bottoms. On landfill side slopes, the geotextiles are generally sewn.

(1) Overlap Seams.

(a) Ensure overlaps meet the minimum specified requirements. Typically, geotextile edges are overlapped a minimum of 300 to 600 mm (12 to 24 inches). If the geotextile is being placed on a soft subgrade, the overlap distance may need to be greater.

(b) Where it is required that seams be oriented across the slope, the upper layer should be lapped over the lower layer.

(c) Inspect for openings in the seams during placement of cover soil.

(2) Sewn Seams. If sewn seams are used, check the specifications to determine if trial seams are required.

(a) Ensure sewn seams are continuous. Spot sewing is generally not allowed.

(b) Verify seams are sewn at the locations shown on the drawings.

(c) Determine if the specifications require a specific type of stitch be used for sewn seams.

(d) Verify that the minimum distance from the geotextile edge to the stitch line nearest to that edge is as recommended by the manufacturer.

(e) The thread at the end of each seam run should be tied off to prevent unraveling.

(f) Inspect for skipped stitches or discontinuities. These areas should be sewn with an extra line of stitching with 450 mm (18 inches) of overlap on each side.

(g) Check the specifications to determine if the sewn seams must be tested for strength.

e. Repairs.

(1) Require geotextile damaged during installation to be repaired by placing a patch of the same type of geotextile over the damaged area. Patches generally extend a minimum of 300 mm (12 inches) beyond the edge of the damage or defect.

(2) Patches should be continuously fastened using a hand or machine sewn seam or other approved method. The machine direction of the patch should be aligned with the geotextile being repaired. Machine direction is defined as the long direction of the geotextile.

f. Covering. Refer to Chapter 3.9 Cover Soil Layer for information on cover soil placement.